



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/632,430  | 07/31/2003  | Stephen M. Kelly     | Hul-003             | 2848             |
| 7590  | 03/16/2005  |                      | EXAMINER            |                  |
| Ronald D. Trice<br>PMB 138<br>2101 Crystal Plaza Arcade<br>Arlington, VA 22202-4600 |             |                      | BERMAN, SUSAN W     |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 1711                |                  |

DATE MAILED: 03/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

UD

|                              |                            |                  |
|------------------------------|----------------------------|------------------|
| <b>Office Action Summary</b> | Application No.            | Applicant(s)     |
|                              | 10/632,430                 | KELLY ET AL.     |
|                              | Examiner<br>Susan W Berman | Art Unit<br>1711 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-70 is/are pending in the application.
  - 4a) Of the above claim(s) 51-70 is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-50 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) 1-70 are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 31 July 2003 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    - a) All    b) Some \* c) None of:
      1. Certified copies of the priority documents have been received.
      2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
      3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | Paper No(s)/Mail Date. _____.   |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/03</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|   | 6) <input type="checkbox"/> Other: _____.                                   |

***Election/Restrictions***

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-50, drawn to a method of forming a polymer layer that is charge-transporting or luminescent, classified in class 427, subclass 496.
- II. Claims 51-70, drawn to a charge-transporting or luminescent polymeric layer, classified in class 428, subclass 1.1.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the product as claimed can be made by a materially different method, such as a method not requiring a polymerization rate of the mixture that is greater than the polymerization of one component of the mixture.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

During a telephone conversation with Ronald D. Trice on March 10, 2005, a provisional election was made with traverse to prosecute the invention of Group I, claims 1-50. Affirmation of this election must be made by applicant in replying to this Office action. Claims 51-70 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Art Unit: 1711

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-3, 11-13, 21-23, 31-33, 41-43, 7-9, 17-19, 27-29, 37-39, and 47-49 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a mixture of polymerizable organic monomers able to be aligned, such as a mixture of reactive mesogens with liquid crystalline phases, does not reasonably provide enablement for mixing any known materials that form a polymer network when polymerized. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. See US 2005/0027028, paragraph [0015].

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-3, 11-13, 21-23, 31-33, 41-43, 7-9, 17-19, 27-29, 37-39, and 47-49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims, as written, fail to set forth what

Art Unit: 1711

kind(s) of “first material” and “second material” are required to provide a polymer network that is charge-transporting or luminescent.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-9, 11-19, 21-29, 31-39 and 41-49 are rejected under 35 U.S.C. 102(b) as being anticipated by Ninomiya et al (5,654,046 or 5,691,092). Ninomiya et al disclose a method of copolymerizing a mesogenic monomer and a non-mesogenic monomer to obtain a liquid crystal polymer which is mixed with a crosslinking compound and a solvent and applied to a substrate, dried and crosslinked to obtain a crosslinked liquid crystal polymer composition (column 10, lines 8-45). See column 6, line 1, to column 9, line 26.

Claims 1-9, 11-19, 21-29, 31-39 and 41-49 are rejected under 35 U.S.C. 102(b) as being anticipated by Iijima et al (5,683,838). Iijima et al disclose a coating a mixed solution of liquid crystal and UV curing resin on the surface of an electrode layer and irradiating the mixture to cure. See column 3, lines 13-23, column 8, line 61, to column 10, line 55, and Examples 1-3.

Claims 1, 2, 7-9, 11, 12, 17-19, 21, 22, 27-29, 31, 32, 37-39, 41, 42 and 47-49 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanaka et al (4,292,107). See column 3, lines 3-34, and Example 1.

Claims 1, 2, 7-9, 11, 12, 17-19, 21, 22, 27-29, 31, 32, 37-39, 41, 42 and 47-49 are rejected under 35 U.S.C. 102(b) as being anticipated by Dahlquist (5,411,806). See the Abstract, column 3, lines 7-49, and Example 1.

Claims 1, 2, 7-9, 11, 12, 17-19, 21, 22, 27-29, 31, 32, 37-39, 41, 42 and 47-49 are rejected under 35 U.S.C. 102(b) as being anticipated by Thompson (4,203,792). See the Abstract, and the Examples.

With respect to each of the rejections set forth above:

The polymers formed would be expected to have a uniform structure and a uniform thickness in the absence of evidence to the contrary. None of the references discusses whether the rate of polymerization is greater than, the amount of energy per unit mass used for polymerizing is less than, power level used for polymerizing is less than, time used for polymerizing is less than or crosslink density of the mixture is greater than that of each material separately. However, it is the examiner's position that the disclosed compositions would inherently have a greater rate of polymerization, greater crosslink density, requiring a lower amount of energy, power and time for polymerization than the individual components of the disclosed compositions.

The burden is hereby shifted to applicant to establish by effective argument and/or objective evidence that the prior art product(s) or process(es) do not necessarily possess the characteristics of the claimed products or processes. Note In re Fitzgerald, 205 USPQ 594 (CCPA 1980). The reference discloses all the limitations of the claim(s) except a property or function and the examiner cannot determine whether or not the reference inherently possesses properties or functions which anticipate the claimed invention. See MPEP 2112-2112.02. Note In re Best, 562 F. 2d775, 195 USPQ 433 (CCPA

1977). Therefore, the *prima facie* case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 13, 23, 33 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ninomiya et al (5,654,046 or 5,691,092) or Iijima et al (5,683,838). Ninomiya et al disclose optical elements comprising a liquid crystal polymer layer but do not mention using electron beam polymerizing. Iijima et al disclose optical information recording elements comprising a liquid crystal polymer layer but do not mention using electron beam polymerizing. It would have been obvious to one skilled in the art at the time of the invention to substitute electron beam polymerizing for ultraviolet light polymerizing in the methods disclosed by Ninomiya et al or by Iijima et al because the disclosed compositions comprise polymerizable materials known by one skilled in the art to be polymerizable by radiation. One of ordinary skill in the art at the time of the invention would have been motivated by a reasonable expectation of polymerizing the polymerizable materials disclosed by exposure to electron beam radiation instead of ultraviolet radiation.

Claims 10, 20, 30, 40 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ninomiya et al (5,654,046 or 5,691,092) or Iijima et al (5,683,838), as applied to claims above and further in view of Shashidhar et al (5,578,351). Ninomiya et al disclose optical elements comprising a

Art Unit: 1711

liquid crystal polymer layer but do not mention using a surface that is an alignment layer that is not rubbed. Iijima et al disclose optical information recording elements comprising a liquid crystal polymer layer but do not mention using a surface that is an alignment layer that is not rubbed. Shashidhar et al teach providing a superior surface for alignment of liquid crystals without any rubbing of the aligning layer (column 3, line 66, to column 4, line 10). It would have been obvious to one skilled in the art at the time of the invention to employ the unrubbed surface for alignment of liquid crystals disclosed by Shashidhar et al as the surface in the optical elements disclosed by Ninomiya et al or in the information recording elements disclosed by Iijima et al. One of ordinary skill in the art at the time of the invention would have been motivated by the expectation of taking advantage of the superior alignment properties of the surfaces, such as uniform planar alignment, as taught by Shashidhar et al.

### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hanna et al (6,218,061) is cited for teaching a charge transport liquid crystal material.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan W Berman whose telephone number is 571 272 1067. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on 571 272 1078. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1711

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Susan W Berman  
Primary Examiner  
Art Unit 1711

sb  
3/14/05